

Evaluation of Freeway Motorist Assist

A research study by Organizational Results in cooperation with the St. Louis Area District Traffic and Highway Safety Division

MoDOT Summary Statement

This research document builds on the previous Return on Investment (ROI) Study of Motorist Assist (1994) that evaluated the St. Louis Motor Assist program to establish and update current benefits of this program. The following is a summary of findings:

St. Louis Motor Assist Program

- *Produced a benefit-cost ratio is 38.25 to 1*
- *Reduced 1,082 secondary crashes per year with annual net social benefits of \$78,264,017*
- *Reduced \$ 1,130,000 in annual congestion cost*
- *Supported Community Emergency Response*
- *Resulted in safer and quicker incident response and clearance*
- *Reduced ER resources for TIM activities freeing them for other community needs*

Background

A sustainable transportation system requires better utilization of available limited resources to deliver a safe and efficient transportation system. MoDOT is a national leader in developing and implementing Traffic Incident Management (TIM) elements as part of the sustainable transportation system in Missouri. From the successful Motorist Assist (MA) programs in St. Louis and Kansas City to its statewide Emergency Response efforts on major interstates, MoDOT is partnering with other emergency responders to better utilize resources to deliver a quicker, safer clearance of impacting incidents along major congested roadways. Through these TIM efforts, MoDOT and its partners are providing a more sustainable transportation system that helps to achieve the two foremost objectives of providing safer and efficient travel in Missouri.

Results

After a detailed analysis of St. Louis crash records for the years 2000 – 2008, the results show the Motorist Assist Program (MA) in St. Louis provides tremendous safety and mobility benefits to the region. The benefit-cost ratio (B/C) is estimated to be 38.25:1. This reflects the reduction of secondary crashes using actual average annual secondary crashes of 859 for 2000 – 2008.

The B/C also reflects a \$1.13 million savings in annual congestion or reduced delay. An interesting by-product of the study was the discovery that secondary crash characteristics are average more severe than primary crashes.

Perhaps, one reason why there are more fatal crashes is because of the sudden encounter with the back of an unexpected queue at high-speed and low-volume conditions. Another reason could be there are more PDOs because of a higher incidence of low-severity rear-



Results (cont'd.)

end crashes in high-volume stop-and-go traffic caused by a primary incident. Even though the exact cause of the difference cannot be pinpointed at this point, the difference is clearly evident in the data, found to be statistically significant, and is based on approximately 65,000 crashes of which there are around 7,500 secondary crashes. The data set is large and is from almost all the freeways in the St. Louis region and from almost a full decade. There is every reason to believe that the difference is systematic and not random. The strength of a study based on actual crash reports is that no assumptions are made in terms of driver car-following behavior such as in simulation or shock wave speeds such as in mathematical modeling.

MA is a critical component of an overall Traffic Incident Management (TIM) strategy. Interviews with police agencies consistently affirm the service patrol's excellent working relationship with police, and the service patrol's value in handling traffic control in TIM which enables police to focus on other TIM duties that are more suitable for police.

Without MA the delay would be 2.25 times to 1.89 times of MA delay. So the delay savings ranges from 66,910 vehicle hours to 47,640 vehicle hours. When translated to monetary value using a value of \$23.82/hr, the savings is around \$ 1.59 Million to \$ 1.13 Million. Adding the mobility benefit to the safety benefit, the total annual benefit of \$79,394 is obtained.

Recommendations

As a result of the benefit-cost analysis, evaluators recommend that Freeway MA should be continued and strengthened as a regional TIM component. One weakness is that it is difficult to explain the reasons why the numbers are such without using other variables to control for other factors. And unlike simulation, no sensitivity analysis can be easily performed.

The transportation engineering community has only recently begun to focus on the study of the nature of secondary crashes due to the availability of more detailed forms of safety data and the ability of performing data fusion with other data sources such as traffic data, incident reports, and media reports. Such investigations should reveal practical strategies to mitigate further the effects of primary incidents.